

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) An anti-microbial composition consisting essentially of:

(i) at least one ~~first~~ anti-microbial agent, wherein at least one of the anti-microbial agents is a first anti-microbial agent having a high surface tension of from 20 to 35 mN/m, and selected from the group consisting of (a) a quarternary ammonium compound having the general formula $R^1R^2R^3R^4N^+X^-$, in which one or two of the R groups are alkyl substituted by aryl or interrupted by aryl or ~~a heteroatom~~ oxygen and the other R groups are the same or different and are C₁ to C₄ alkyl groups, (b) a dialkyldimethylammonium compound wherein the two non-methyl alkyl groups are selected from alkyl groups comprising from 8 to 12 carbon atoms ~~medium and long chain alkyl groups comprising 8 or more carbon atoms~~, and (c) a benzalkonium halide or an aryl ring substituted benzalkonium halide,

(ii) at least one compound having a low surface tension of from 8 to 14 mN/m, and selected from the group consisting of silanes, soya lecithins, polydimethylsiloxanes, polydimethylhydroxysiloxanes, and mixtures thereof, and

(iii) ~~optionally, at least one additional anti-microbial agent and~~

[[iv]] at least one polar solvent, wherein in use the anti-microbial composition acts substantially to reduce or control the formation of microbial colonies on or at a surface to which the composition is applied.

2. – 45. (canceled).

46. (previously presented) An anti-microbial composition according to Claim 1, wherein the surface tension of the at least one compound (ii) is 10 mN/m.

47. (currently amended) An anti-microbial composition according to Claim 1, wherein the ~~at least one~~ first anti-microbial agent is hydrophobic.

48. (previously presented) An anti-microbial composition according to Claim 1, wherein the at least one compound (ii) is hydrophilic.

49. (currently amended) An anti-microbial composition according to Claim 1, wherein the ~~at least one~~ first anti-microbial agent is hydrophobic and the at least one compound (ii) is hydrophilic.

50. – 51. (canceled)

52. (currently amended) An anti-microbial composition according to Claim 1, wherein the at least one ~~first~~ anti-microbial agent ~~and/or the at least one additional anti-microbial agent~~ is of a polar nature.

53. (original) An anti-microbial composition according to Claim 1, comprising at least one anti-microbial agent selected from bacteriocidal, fungicidal, algicidal, yeasticidal and moldicidal agents.

54. – 58. (canceled).

59. (previously presented) An anti-microbial composition according to Claim 1, comprising a dialkyldimethylammonium compound wherein the two non-methyl alkyl groups are selected from C₈ to C₁₂ alkyl.

60. (canceled)

61. (previously presented) An anti-microbial composition according to Claim 1, wherein the quaternary ammonium compound is selected from benzenemethanaminium N-dodecyl-N,N-dimethylchloride, and benzyl-C₁₂-C₁₆-alkyldimethyl-ammoniumchloride.

62. (currently amended) An anti-microbial composition according to Claim 1, wherein the at least one ~~additional~~ anti-microbial agent is selected from an amphoteric compound, an iodophore, a phenolic compound, a quaternary ammonium compound, a hypochlorite and a nitrogen based heterocyclic compound.

63. – 69. (canceled).

70. (previously presented) An anti-microbial composition according to Claim 62, wherein the or each phenolic compound is selected from a methyl, ethyl, butyl, halo and aryl substituted phenol.

71. (previously presented) An anti-microbial composition according to Claim 62, wherein the or each phenolic compound is selected from 2-phenylphenol, 2-benzyl-4-chlorophenol, 2-cyclopentanol-4-chlorophenol, 4-t-amyphenol, 4-t-butylphenol, 4-chloro-2-pentylphenol, 6-chloro-2-pentylphenol, p-chlorometa-xylene, 2,4,4-trichloro-2-hydroxydiphenol, thymol, 2-i-propyl-3-methylphenol, chlorothymol, 3-methyl-4-chlorophenol, 2,6-dichloro-4-n-alkyl phenols, 2,4-dichloro-meta-xylene, 2,4,6-trichlorophenol and 2-benzyl-4-chlorophenol.

72. – 77. (canceled).

78. (currently amended) A composition according to Claim 1, wherein the ~~at least one~~ first anti-microbial agent is selected from benzenemethanaminium N-dodecyl-N,N-dimethylchloride, and benzyl-C₁₂-C₁₆-alkyldimethyl-ammoniumchloride, and the at least one additional anti-microbial

agent is selected from 2-phenylphenol, 2-octyl-2H-isothiazol-3-one, 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one.

79. – 81. (canceled).

82. (previously presented) An anti-microbial composition according to Claim 1, comprising from 1 to 4% by volume of the at least one compound (ii).

83. (previously presented) An anti-microbial composition according to Claim 1, wherein the at least one polar solvent is selected from water, an alcohol, an ester, a hydroxyl or glycol ester, a polyol, a ketone, and mixtures thereof.

84. (previously presented) An anti-microbial composition according to Claim 1, wherein the at least one polar solvent is selected from n-propanol, water, isopropanol, diethylene glycol and dipropylene glycol.

85. (previously presented) An anti-microbial composition according to Claim 1, comprising from 1 to 70% by volume of the at least one polar solvent.

86. – 87. (canceled)

88. (original) A formulation comprising the anti-microbial composition according to Claim 1, and a functional material.

89. (original) A formulation according to Claim 88, wherein the functional compound is selected from plastics, fibres, coatings, films, laminates, adhesives, sealants, clays, china, ceramics, concrete, sand, paints, varnishes, lacquers, cleaning agents and settable or curable compositions such as fillers, grouts, mastics and putties.

90. (original) A formulation according to Claim 88, wherein the formulation comprises from 0.1 to 5.0% by weight of the anti-microbial composition.

91. (original) A formulation according to Claim 88, wherein the formulation comprises from 0.5 to 2.0% by weight of the anti-microbial composition.

92. (previously presented) A method of reducing or controlling the formulation of colonies of microorganisms on a surface, which method comprises applying the anti-microbial composition according to Claim 1 to the surface.

93. – 94. (canceled)

95. (previously presented) A method of reducing or controlling the formulation of colonies of microorganisms on a surface, which method comprises applying the formulation of Claim 88 to the surface.

96. (previously presented) A method of reducing or controlling the formulation of colonies of microorganisms on a surface, which method comprises applying the formulation of Claim 89 to the surface.

97. (previously presented) A method of reducing or controlling the formulation of colonies of microorganisms on a surface, which method comprises applying the formulation of Claim 90 to the surface.

98. (previously presented) A method of reducing or controlling the formulation of colonies of microorganisms on a surface, which method comprises applying the formulation of Claim 91 to the surface.

99. (currently amended) A method of manufacturing an anti-microbial composition according to Claim 1, the method comprising the steps of (a) mixing the ~~at least one~~ first anti-microbial agent and any additional anti-microbial agents together, (b) adding the at least one compound (ii) to the ~~at least one~~ first anti-microbial agent, (c) adding the at least one polar solvent to the mixture of the at least one compound (iii) and anti-microbial agent(s) and (d) agitating the resulting mixture until a clear solution is formed.

100. (original) A method of manufacturing a formulation comprising the step of adding the anti-microbial composition of Claim 1 to a functional material .

101. – 104. (canceled).

105. (previously presented) An anti-microbial composition according to claim 1, wherein the at least one compound (ii) is selected from polydimethylsiloxanes, polydimethyl hydrosiloxanes and mixtures thereof.

106. (currently amended) An anti-microbial composition containing as a solvent a polar solvent which is water, at least one alcohol, ~~at least one hydroxyl ester,~~ at least one glycol ester, at least one polyol, at least one ketone or a mixture thereof, and comprising:

- (i) at least one first anti-microbial agent having a high surface tension of from 20 to 35 mN/m and selected from the group consisting of (a) a quarternary ammonium compound having the general formula $R^1R^2R^3R^4N^+X^-$, in which one or two of the R groups are alkyl substituted by aryl or interrupted by aryl or a heteroatom and the other R groups are the same or different and are C₁ to C₄ alkyl groups, (b) a dialkyldimethylammonium compound wherein the two non-methyl alkyl groups are selected from medium and long chain alkyl groups comprising 8 or more carbon atoms, and (c) a benzalkonium halide or an aryl ring substituted benzalkonium halide; and
- (ii) at least one compound having a low surface tension of from 8 to 14

mN/m and selected from the group consisting of silanes, soya lecithins, polydimethylsiloxanes, polydimethylhydroxysiloxanes, and mixtures thereof, wherein in use the anti-microbial composition acts substantially to reduce or control the formation of microbial colonies on or at a surface to which the composition is applied.

107. (previously presented) An anti-microbial composition according to Claim 106, wherein the surface tension of the at least one compound (ii) is 10 mN/m.

108. (previously presented) An anti-microbial composition according to Claim 106, wherein the at least one first anti-microbial agent is hydrophobic.

109. (previously presented) An anti-microbial composition according to Claim 106, wherein the at least one compound (ii) is hydrophilic.

110. (previously presented) An anti-microbial composition according to Claim 106, wherein the at least one first anti-microbial agent is hydrophobic and the at least one compound (ii) is hydrophilic.

111. (previously presented) An anti-microbial composition according to Claim 106 comprising at least one additional anti-microbial agent.

112. (previously presented) An anti-microbial composition according to Claim 111, wherein the at least one first anti-microbial agent and/or the at least one additional anti-microbial agent is of a polar nature.

113. (previously presented) An anti-microbial composition according to Claim 106 comprising at least one anti-microbial agent selected from bacteriocidal, fungicidal, algicidal, yeasticidal and moldicidal agents.

114. (previously presented) An anti-microbial composition according to Claim 106 comprising a dialkyldimethylammonium compound wherein the two non-methyl alkyl groups are selected from C₈ to C₁₂ alkyl.

115. (previously presented) An anti-microbial composition according to Claim 106, wherein the quarternary ammonium compound is selected from benzenemethanaminium N-dodecyl-N,N-dimethylchloride, and benzyl-C₁₂-C₁₆-alkyldimethyl-ammoniumchloride.

116. (previously presented) An anti-microbial composition according to Claim 111, wherein the at least one additional anti-microbial agent is selected from

amphoteric compounds, iodophores, phenolic compounds, quarternary ammonium compounds, hypochlorites and nitrogen-based heterocyclic compounds.

117. (previously presented) An anti-microbial composition according to Claim 116, wherein the or each phenolic compound is selected from a methyl, ethyl, butyl, halo and aryl substituted phenol.

118. (previously presented) An anti-microbial composition according to Claim 116, wherein the or each phenolic compound is selected from 2-phenylphenol, 2-benzyl-4-chlorophenol, 2-cyclopentanol-4-chlorophenol, 4-t-amylphenol, 4-t-butylphenol, 4-chloro-2-pentylphenol, 6-chloro-2-pentylphenol, p-chlorometa-xlenol, 2,4,4-trichloro-2-hydroxydiphenol, thymol, 2-i-propyl-3-methylphenol, chlorothymol, 3-methyl-4-chlorophenol, 2,6-dichloro-4-n-alkyl phenols, 2,4-dichloro-meta-xlenol, 2,4,6-trichlorophenol and 2-benzyl-4-chlorophenol.

119. (previously presented) A composition according to Claim 111, wherein the at least one first anti-microbial agent is selected from benzenemethanaminium N-dodecyl-N,N-dimethylchloride and benzyl-C₁₂-C₁₆-alkyldimethyl-ammoniumchloride, and the at least one additional anti-microbial agent is selected from 2-phenylphenol, 2-octyl-2H-isothiazol-3-one, 5-chloro-2-methyl-2H-isothiazol-3-one, and 2-methyl-2H-isothiazol-3-one.

120. (previously presented) An anti-microbial composition according to Claim 106, comprising from 1 to 4% by volume of the at least one compound (ii).

121. (previously presented) An anti-microbial composition according to Claim 106, wherein the polar solvent is selected from n-propanol, water, isopropanol, diethylene glycol, dipropylene glycol and mixtures thereof.

122. (previously presented) An anti-microbial composition according to Claim 106, comprising from 1 to 70% by volume of the polar solvent.

123. (previously presented) An anti-microbial composition according to Claim 106, wherein the at least one compound (ii) is selected from polydimethylsiloxanes, polydimethylhydrosiloxanes and mixtures thereof.

124. (previously presented) A formulation comprising the anti-microbial composition according to Claim 106, and a functional material.

125. (previously presented) A formulation according to Claim 124, wherein

the functional compound is selected from plastics, fibres, coatings, films, laminates, adhesives, sealants, clays, china, ceramics, concrete, sand, paints, varnishes, lacquers, cleaning agents and settable or curable compositions such as fillers, grouts, mastics and putties.

126. (previously presented) A formulation according to Claim 124, wherein the formulation comprises from 0.1 to 5.0% by weight of the anti-microbial composition.

127. (previously presented) A formulation according to Claim 124, wherein the formulation comprises from 0.5 to 2.0% by weight of the anti-microbial composition.

128. (previously presented) A method of reducing or controlling the formulation of colonies of microorganisms on a surface, which method comprises applying the anti-microbial composition according to Claim 106 to the surface.

129. (previously presented) A method of reducing or controlling the formulation of colonies of microorganisms on a surface, which method comprises applying the formulation of Claim 124 to the surface.

130. (previously presented) A method of reducing or controlling the formulation of colonies of microorganisms on a surface, which method comprises applying the formulation of Claim 125 to the surface.

131. (previously presented) A method of reducing or controlling the formulation of colonies of microorganisms on a surface, which method comprises applying the formulation of Claim 126 to the surface.

132. (previously presented) A method of reducing or controlling the formulation of colonies of microorganisms on a surface, which method comprises applying the formulation of Claim 127 to the surface.

133. (previously presented) A method of manufacturing an anti-microbial composition according to Claim 106, the method comprising the steps of (a) mixing the or each anti-microbial agents together, (b) adding the at least one compound (ii) to the mixture of step (a), (c) adding the polar solvent to the mixture of step (b), and (d) agitating the resulting mixture until a clear solution is formed.

134. (previously presented) A method of manufacturing a formulation comprising the step of adding the anti-microbial composition of Claim 106 to a functional material.